Exercise - I (Conceptual Questions) Build Up Your Understanding

INTRODUCTION TO SOIL AS RESERVOIR OF ESSENTIAL ELEMENTS

1. Which of the following group of elements is not essential for a normal plant ?
(1) K, Ca, Mg (2) Fe, Zn, Mn, B
(3) Pb, I, Na (4) Mg, Fe, Mo

2. Hydroponics is a technique in which plants are grown in :-
(1) Green house
(2) Water saturated sand
(3) Balanced nutrient solution
(4) Purified distilled water

3. For chlorophyll formation a plant needs :-
(1) Fe, Ca & light (2) Fe, Mg & Light
(3) Ca, K & light (4) Mn & Cu

4. Brown heart rot of beets is due to deficiency of-
(1) B (2) P (3) Mg (4) Mo

5. Die back disease in citrus is due to deficiency of:-
(1) Mo (2) B
(3) Cu (4) Zn

6. Protoplasmic elements are :-
(1) C, H, O, P, N, S (2) C, H,O, Fe, N
(3) N, S, Fe, P, K (4) Fe, Mg, Ca, N, P

7. Which element is not considered as macronutrient ?
(1) Mg (2) Ca
(3) Mn (4) P

8. The element which can not be placed along with micronutrients :-
(1) Mn (2) Mo
(3) Cu (4) Ca

9. The amino acid having S in its composition is-
(1) Methionine (2) Cysteine
(3) Both (1) & (2) (4) Glutamic acid

10. The group of mineral nutrients known as frame work elements :-
(1) N, S, P (2) C, H, O
(3) Mg, Fe, Zn (4) Zn, Mn, Cu

11. Which element essential for stability of chromosome structure ?
(1) Zn (2) Ca
(3) Mo (4) Fe

12. Which element is required in comparatively less quantity for the growth of plant ?
(1) Zn (2) N
(3) P (4) Ca

13. Which mineral nutrients are called critical element for crops ?
(1) N, P, K (2) C, H, O
(3) N, S, Mg (4) K, Ca, Fe

14. Which is most common free ion present in a cell?
(1) P (2) K
(3) Fe (4) B

15. Which element related with Khaira disease of Paddy & auxin synthesis ?
(1) Fe (2) Zn
(3) B (4) Cu

16. Plants absorb nitrogen mainly in the form of:–
(1) NO_2^- (2) NO_3^-
(3) $N \equiv N$ (4) HNO_2

17. The most abundant element present in the plants is –
(1) Iron (2) Carbon
(3) Nitrogen (4) Manganese

18. Which is essential for nitrogen metabolism?
(1) B (2) Mo
(3) Cu (4) Mg

19. The major portion of the **dry weight** of plants comprises of :-
(1) Nitrogen, phosphorus and potassium
(2) Calcium, magnesium and sulphur
(3) Carbon, nitrogen and hydrogen
(4) Carbon, hydrogen and oxygen

20. Gray speck of Oat are caused by deficiency of:
(1) Cu (2) Zn
(3) Mn (4) Fe

TG: @Chalnaayaaar

TG: @Chalnaayaaar

21. Which of the following element is most mobile in plant?
(1) Calcium (2) Nitrogen
(3) Carbon (4) Magnesium

22. Which of the following is a part of cytochrome?
(1) Mg (2) Zn
(3) Fe (4) Ca

23. The mineral present in middle lamella is :-
(1) Na (2) Ca
(3) K (4) Mn

24. Which of the following is a trace element?
(1) S (2) Mg (3) Cu (4) Ca

25. In plant metabolism phosphorus play a major role to :-
(1) Evolve oxygen during photosynthesis
(2) Create aerobic condition
(3) Generate metabolic energy
(4) Evolve carbon dioxide during respiration

26. Chlorosis is caued due to deiciency of :-
(1) Mg (2) Ca
(3) B (4) Cl

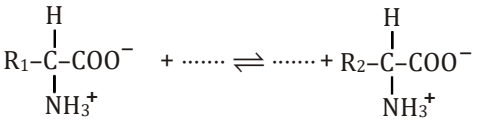
27. The mineral nutrient mainly concerning with apical meristematic activity, is :-
(1) B (2) Ca
(3) N (4) S

28. Which of the following does NPK denote?
(1) Nitrogen, Potassium, Kinetin
(2) Nitrogen, Protein, Kinetin
(3) Nitrogen, Protein, Potassium
(4) Nitrogen, Phosphorus, Potassium

NITROGEN METABOLISM

29. During the formation of amides from amino acids:-
(1) COOH part of acid is replaced by NH_2
(2) NH_2 part of acid is replaced by COOH
(3) OH part of acid group is replaced by NH_2
(4) NH_2 part of acid is replaced by OH

TG: @Chalnaayaaar

30. 

Choose the **correct** symbol for the above blanks respectively:-

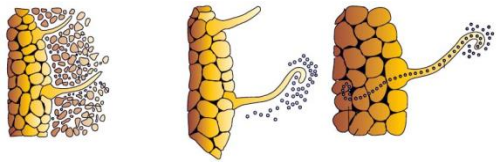
(1) $R_1-\underset{\underset{O}{\|}}{C}-COO^-$, $R_2-\underset{\underset{O}{\|}}{C}-COO^-$

(2) $R_1-\underset{\underset{O}{\|}}{C}-COO^-$, $R_1-\underset{\underset{O}{\|}}{C}-COO^-$

(3) $R_2-\underset{\underset{O}{\|}}{C}-COO^-$, $R_1-\underset{\underset{O}{\|}}{C}-COO^-$

(4) $R_2-\underset{\underset{O}{\|}}{C}-COO^-$, $R_2-\underset{\underset{O}{\|}}{C}-COO^-$

31. The figure below shows three steps (A, B, C) of development of root nodules in soyabean. Select the option giving correct identification together with what it represents ?



(A) **(B)** **(C)**

(1) **A**–Mature nodule complete with vascular tissues
(2) **C**–Infection thread carries the bacteria to the cortex
(3) **B**–Release of excess bacteria from root nodules
(4) **A**–Root hairs absorb leghaemoglobin from the soil

32. In root nodules of legumes, leghaemoglobin is important because it :-
(1) acts as a catalyst in transamination
(2) transports oxygen to the root nodule
(3) provide energy to the nitrogen fixing bacteria
(4) acts as an oxygen scavenger

33. Generally plants absorb nitrogen in the form of :–
(1) NO_2^- (2) NO_3^-
(3) N_2 (4) HNO_2

34. Which one of the following options give the correct match of nitrogen fixing organisms with their types (A, B, C) ?

	A **Free living aerobic**	**B** **Free living anaerobic**	**C** **Symbiotic**
(1)	*Rhodospirillum*	*Rhizobium*	*Azotobacter*
(2)	*Rhizobium*	*Azotobacter*	*Rhodospirillum*
(3)	*Rhodospirillum*	*Azotobacter*	*Rhizobium*
(4)	*Azotobacter*	*Rhodospirillum*	*Rhizobium*

35. The bacteria which convert nitrate in to molecular nitrogen are called :

(1) Nitrifying bacteria

(2) Methanobacteria

(3) Diazotrophic bacteria

(4) Denitrifying bacteria

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	3	2	1	3	1	3	4	3	2	2	1	1	2	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	2	2	4	3	2	3	2	3	3	1	2	4	3	3
Question	31	32	33	34	35										
Answer	2	4	2	4	4										

TG: @Chalnaayaaar

TG: @Chalnaayaaar

Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT 2007

1. A plant requires magnesium for :-
(1) Cell wall development
(2) Holding cells together
(3) Protein synthesis
(4) Chlorophyll synthesis

2. Which of the following is a flowering plant with nodules containing filamentous nitrogen-fixing microorganism?
(1) Cicer arietinum
(2) Casuarina equisetifolia
(3) Crotalaria juncea
(4) Cycas revoluta

3. About 98 percent of the mass of every living organism is composed of just six elements including carbon, hydrogen, nitrogen, oxygen and :-
(1) Calcium and phosphorus
(2) Phosphorus and sulphur
(3) Sulphur and magnesium
(4) Magnesium and sodium

4. Which one of the following elements is not an essential micronutrient for plant growth?
(1) Ca (2) Mn (3) Zn (4) Cu

AIPMT 2008

5. Nitrogen flxation in root nodules of Alnus is brought about by :-
(1) *Frankia* (2) *Azorhizobium*
(3) *Bradyrhizobium* (4) *Clostridium*

AIPMT 2009

6. Manganese is required in :-
(1) Plant cell wall formation
(2) Photolysis of water during photosynthesis
(3) Chlorophyll synthesis
(4) Nucleic acid synthesis

7. Which of the following is a symbiotic nitrogen fixer?
(1) Azotobacter (2) Frankia
(3) Azolla (4) Glomus

TG: @Chalnaayaaar

AIPMT Pre-2010

8. An element playing important role in nitrogen fixation is :-
(1) Molybdenum (2) Copper
(3) Manganese (4) Zinc

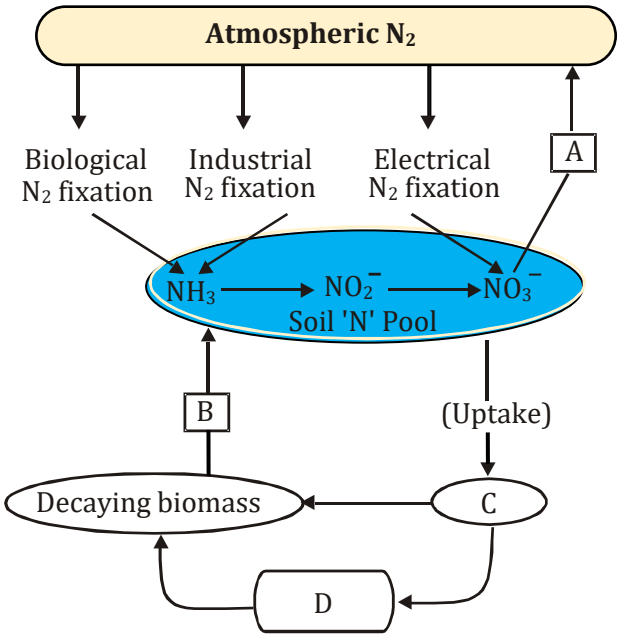
9. Which one of the following is not a micronutrient?
(1) Molybdenum (2) Magnesium
(3) Zinc (4) Boron

10. One of the free-living, anaerobic nitrogen - fixer is :-
(1) Beijernickia
(2) Rhodospirillum
(3) Rhizobium
(4) Azotobacter

11. The common nitrogen - fixer in paddy fields is:-
(1) *Rhizobium* (2) *Azospirillum*
(3) *Oscillatoria* (4) *Frankia*

AIPMT Mains-2010

12. Study the cycle shown below and select the option which gives correct words for the all the four blanks A, B, C and D. :-



	A	B	C	D
(1)	Denitrifica-tion	Ammonifica-tion	Plants	Animals
(2)	Nitrification	Denitrifica-tion	Animals	Plants
(3)	Denitrifica-tion	Nitrification	Plants	Animals
(4)	Nitrification	Ammonifica-tion	Animals	Plants

13. Leguminous plants are able to fix atmospheric nitrogen through the process of symbiotic nitrogen fixation. Which one of the following statements is not correct during this process of nitrogen fixation?
(1) Nodules act as sites for nitrogen fixation
(2) The enzyme nitrogenase catalyses the converison of atmospheric N_2 to NH_3
(3) Nitrogenase is insensitive to oxygen
(4) Leghaemoglobin scavenges oxygen and is pinkish in colour

AIPMT Pre-2011

14. A prokaryotic autotrophic nitrogen fixing symbiont is found in :-
(1) Alnus (2) Cycas
(3) Cicer (4) Pisum

15. Which one of the following elements in plants is not remobilised?
(1) Phosphorus (2) Calcium
(3) Potassium (4) Sulphur

16. An organism used as a biofertilizer for raising soyabean crop is :-
(1) Azotobacter
(2) Azospirillum
(3) Rhizobium
(4) Nostoc

17. Nitrifying bacteria:-
(1) Oxidize ammonia to nitrates
(2) Convert free nitrogen to nitrogen compounds
(3) Convert proteins into ammonia
(4) Reduce nitrates to free nitrogen

18. The function of leghemoglobin in the root nodules of legumes is :-
(1) Inhibition of nitrogenase activity
(2) Oxygen removal
(3) Nodule differentiation
(4) Expression of nif gene

AIPMT Mains-2011

19. Which one of the following is not an essential mineral element for plants while the remaining three are?
(1) Phosphorus (2) Iron
(3) Manganese (4) Cadmium

20. Which one of the following is essential for photolysis of water?
(1) Boron (2) Manganese
(3) Zinc (4) Copper

AIPMT Pre-2012

21. Best defined function of Manganese in green plants is :-
(1) Nitrogen fixation
(2) Water absorption
(3) Photolysis of water
(4) Calvin cycle

22. Which one of the following is wrong statement?
(1) Phosphorus is a constituent of cell membranes, certain nucleic acids and all proteins
(2) Nitrosomonas and Nitrobacter are chemoautotrophs
(3) Anabaena and Nostoc are capable of fixing nitrogen in free-living state also
(4) Root nodule forming nitrogen fixers live as aerobes under free-living conditions

AIPMT Mains 2012

23. For its action, nitrogenase requires :-
(1) Mn^{2+}
(2) Super oxygen redicals
(3) High input of energy
(4) Light

TG: @Chalnaayaaar

TG: @Chalnaayaaar

NEET-UG 2013

24. The first stable product of fixation of atmospheric nitrogen in leguminous plants is:-
(1) Glutamate (2) NO_2^-
(3) Ammonia (4) NO_3^-

AIPMT 2014

25. Deficiency symptoms of nitrogen and potassium are visible first in :-
(1) Senescent leaves (2) Young leaves
(3) Roots (4) Buds

AIPMT 2015

26. Minerals known to be required in large amounts for plant growth include :-
(1) calcium, magnesium, manganese, copper
(2) potassium, phosphorus, selenium, boron
(3) magnesium, sulphur, iron, zinc
(4) phosphorus, potassium, sulphur, calcium

Re-AIPMT 2015

27. During biological nitrogen fixation, inactivation of nitrogenase by oxygen poisoning is prevented by :-
(1) Cytochrome
(2) Leghemoglobin
(3) Xanthophyll
(4) Carotene

28. The oxygen evolved during photosynthesis comes from water molecules. Which one of the following pairs of elements is involved in this reaction?
(1) Magnesium and Chlorine
(2) Manganese and Chlorine
(3) Manganese and Potassium
(4) Magnesium and Molybdenum

NEET-II 2016

29. Which is essential for the growth of root tip?
(1) Ca (2) Mn
(3) Zn (4) Fe

TG: @Chalnaayaaar

NEET-UG 2017

30. Select the mismatch :-
(1) Rhodospirillum – Mycorrhiza
(2) Anabaena - Nitrogen fixer
(3) Rhizobium – Alfalfa
(4) Frankia - Alnus

NEET-UG 2018

31. In which of the following forms is iron absorbed by plants?
(1) Ferric
(2) Ferrous
(3) Free element
(4) Both ferric and ferrous

32. Which of the following elements is responsible for maintaining turgor in cells?
(1) Magnesium (2) Sodium
(3) Potassium (4) Calcium

NEET-UG 2019

33. Thiobacillus is a group of bacteria helpful in carrying out :-
(1) Nitrogen fixation
(2) Chemoautotrophic fixation
(3) Nitrification
(4) Denitrification

NEET-UG (Odisha) 2019

34. Which of the following bacteria reduce nitrate in soil into nitrogen?
(1) *Nitrobacter* (2) *Nitrococcus*
(3) *Thiobacillus* (4) *Nitrosomonas*

NEET-UG 2020

35. The product(s) of reaction catalyzed by nitrogenase in root nodules of leguminous plants is/are :
(1) Ammonia and hydrogen
(2) Ammonia alone
(3) Nitrate alone
(4) Ammonia and oxygen

36. Match the following concerning essential elements and their functions in plants :

(a) Iron	(i) Photolysis of water
(b) Zinc	(ii) Pollen germination
(c) Boron	(iii) Required for chlorophyll biosynthesis
(d) Manganese	(iv) IAA biosynthesis

Select the correct option :

	(a)	(b)	(c)	(d)
(1)	(iv)	(i)	(ii)	(iii)
(2)	(ii)	(i)	(iv)	(iii)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(iii)	(iv)	(ii)	(i)

NEET-UG (COVID-19) 2020

37. In Glycine max, the product of biological nitrogen fixation is transported from the root nodules to other parts as :

(1) Ammonia (2) Glutamate
(3) Nitrates (4) Ureides

38. Which of the following elements helps in maintaining the structure of ribosomes ?

(1) Magnesium (2) Zinc
(3) Copper (4) Molybdenum

NEET-UG 2021

39. Match Column - I with Column - II.

Column -I		Column - II	
(a)	*Nitrococcus*	**(i)**	Denitrification
(b)	*Rhizobium*	**(ii)**	Conversion of ammonia to nitrite
(c)	*Thiobacillus*	**(iii)**	Conversion of nitrite to nitrate
(d)	*Nitrobacter*	**(iv)**	Conversion of atmospheric nitrogen to ammonia

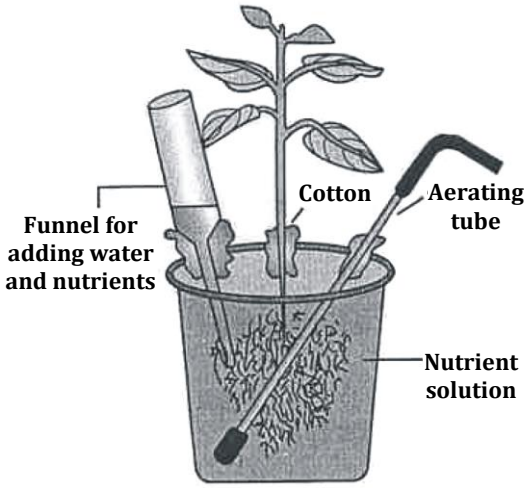
Choose the correct answer from options given below.

	(a)	(b)	(c)	(d)
(1)	(ii)	(iv)	(i)	(iii)
(2)	(i)	(ii)	(iii)	(iv)
(3)	(iii)	(i)	(iv)	(ii)
(4)	(iv)	(iii)	(ii)	(i)

TG: @Chalnaayaaar

NEET-UG (Paper-2) 2021

40. This setup is used for



(1) Tissue culture
(2) Soilless culture
(3) Nutrient solution culture
(4) Both (2) and (3)

41. Which of the follwing pair of minerals is involved in the activation of enzymes of photosynthesis and respiration ?

(1) Magnesium and manganese
(2) Manganese and molybdenum
(3) Molybdenum and magnesium
(4) Manganese and chlorine

42. The anaerobic condition for the nitrogenase enzymes has been provided by

(1) Rhizobium bacteria
(2) Nitrate reductase
(3) Leguminous haemoglobin
(4) Glutamate dehydrogenase

NEET-UG 2022

43. Match List-I with List-II.

List-I	List-II
(a) Manganese	(i) Activates the enzyme catalase
(b) Magnesium	(ii) Required for pollen germination
(c) Boron	(iii) Activates enzymes of respiration
(d) Iron	(iv) Functions in splitting of water during photosynthesis

TG: @Chalnaayaaar

Choose the correct answer from the options given below:
(1) (a)—(iv), (b)—(iii), (c)—(ii), (d)—(i)
(2) (a)—(iv), (b)—(i), (c)—(ii), (d)—(iii)
(3) (a)—(iii), (b)—(i), (c)—(ii), (d)—(iv)
(4) (a)—(iii), (b)—(iv), (c)—(i), (d)—(ii)

44. Which one of the following produces nitrogen fixing nodules on the roots of Alnus?
(1) *Frankia*
(2) *Rhodospirillum*
(3) *Beijernickia*
(4) *Rhizobium*

Re-NEET-UG 2022

45. Which of the following protects nitrogenase inside the root nodule of a leguminous plant?
(1) Catalase
(2) leg haemoglobin
(3) Transaminase
(4) Glutamate dehydrogenase

46. Which of the following pair represents free living nitrogen fixing aerobic bacteria?
(1) *Rhizobium* and *Frankia*
(2) *Azotobacter* and *Beijernickia*
(3) *Anabaena* and *Rhodospirillum*
(4) *Pseudomonas* and *Thiobacillus*

EXERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	4	2	1	1	1	2	2	1	2	2	3	1	3	2	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	3	1	2	4	2	3	1	3	3	1	4	2	2	1	1
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	1	3	4	3	1	4	4	1	1	4	1	3	1	1	2
Question	46														
Answer	2														

TG: @Chalnaayaaar

Exercise - III Master Your Understanding

EXERCISE-III (A) NCERT BASED QUESTIONS

1. Which element is an activator of enzyme used in nitrogen fixation ?
(1) Mg (2) Mo (3) Zn (4) Cu

2. Microbe producing nitrogen fixing nodule on the roots of non-leguminous plant (eg. *Alnus*) is–
(1) *Rhizobium* (2) *Azotobacter*
(3) *Rhodospirillum* (4) *Frankia*

3. In the following which is not a function of calcium?
(1) Synthesis of cell wall
(2) Formation of mitotic spindle
(3) Formation of chlorophyll
(4) Normal functioning of cell membrane

4. Symptoms of manganese toxicity may actually be the deficiency symptoms of :-
(1) Iron (2) Magnesium
(3) Calcium (4) All the above

5. Which of the following is/are free living in soil, but as symbionts, can fix atmospheric nitrogen ?
(1) Rhizobium (2) Frankia
(3) Both (1) and (2) (4) Azotobacter

6. Which element delay flowering if its concentration in plants is low ?
(1) Nitrogen (2) Sulphur
(3) Molybdenum (4) All the above

7. Which of the following group is associated with beneficial elements ?
(1) Na, K, Cl, Ca (2) Na, Se, Si Ca
(3) Na, Se, Si, Co (4) N, Se, Si, Co

8. Which of the following is not an anaerobic N_2 fixing organism ?
(1) *Azotobacter*
(2) *Clostridium*
(3) *Rhodospirillium*
(4) *Rhodopseudomonas*

9. Passive absorption of ions usually occurs through:-
(1) Pumps (2) Phospholipids
(3) Ion channels (4) All the above

10. Which of following mineral element is needed during the formation of mitotic spindle, accumulates in older leaves & is involved in normal functioning of cell membrane ?
(1) Fe (2) S
(3) Ca (4) P

11. Which mineral element is needed for synthesis of Auxin?
(1) B (2) Zn
(3) Cu (4) Cl

12. Which mineral element is required for uptake & utilisation of Ca^{+2}, membrane functioning & pollen germination ?
(1) B (2) Zn
(3) Cu (4) Fe

13. Which process results in decrease of nitrogen content in soil ?
(1) Ammonification
(2) Biological nitrogen fixation
(3) Denitrification
(4) Nitrification

14. Any mineral ion concentration in tissues that reduces the dry weight of tissues by about 10 percent is considered as :-
(1) Critical concentration
(2) Toxic concentration
(3) Beneficial concentration
(4) Transition concentration

15. The enzyme, nitrogenase which is capable of nitrogen reduction, is present :-
(1) only in some eukaryotes
(2) exclusively in prokaryotes
(3) exclusively in eukaryotes
(4) in all the living organisms

16. Rhizobium has symbiotic relationship with the roots of :-
(1) Garden pea
(2) *Alfalfa*
(3) Sweet clover
(4) All of the above

TG: @Chalnaayaaar

TG: @Chalnaayaaar

17. Which of the following criteria not exhibits essentiality of any mineral to plants ?
(1) Never substituted by any other mineral
(2) Must be directly involved in metabolism of the plant
(3) Plants do not complete their life cycle properly in the absence of this mineral
(4) Mineral must be present for activity of all enzymes

18. Toxicity of (A) affects the activity and uptake of (B).
(1) A = Mg, B = Fe, Ca and Zn
(2) A = Mn, B = Mg, Ca and Zn
(3) A = Mn, B = Mg and Fe
(4) A = Mg, B = Mn, Fe and Ca

19. Glutamate dehydrogenase is an important enzyme involved in :-
(1) Krebs cycle
(2) amino acid biosynthesis
(3) nitrogen fixation
(4) nitrate reduction

20. Which of the following is the method by which essential elements were identified in plants ?
(1) Plant ash analysis
(2) Hydroponics
(3) Plant tissue culture
(4) Nitrogen fixation

21. Which of the following essential elements is required by plants in excess of 10 m molekg^{-1} of dry matter?
(1) Magnesium (2) Manganese
(3) Molybdenum (4) Selenium

22. Choose the pair from the following in which one element is essential to plant while other is beneficial but not essential.
(1) Copper and Molybdenum
(2) Sodium and Silicon
(3) Chlorine and Cobalt
(4) Selenium and Cobalt

23. Which of the following element is an activator for both ribulose bisphosphate carboxylase oxygenase enzyme and phosphoenol pyruvate carboxylase enzyme?
(1) Zinc (2) Copper
(3) Magnesium (4) Chlorine

24. Choose the pair from the following in which both the elements share common function during photosynthesis in plants.
(1) Chlorine and Magnesium
(2) Potassium and Phosphorus
(3) Boron and Molybdenum
(4) Manganese and Chlorine

25. If deficiency symptoms of any element appear first in the senescent leaves, this element should not be :
(1) Calcium (2) Nitrogen
(3) Potassium (4) Magnesium

26. Which of the following bacteria oxidise the ammonia into nitrite?
(1) *Nitrococcus* (2) *Nitrobacter*
(3) Both (1) and (2) (4) *Thiobacillus*

27. Which of the following is correct regarding non leguminous plant *Alnus*?
(1) Free living nitrogen fixation by *Beijernickia*
(2) Free living nitrogen fixation by *Frankia*
(3) Symbiotic nitrogen fixation by filamentous microbe
(4) Symbiotic nitrogen fixation by *Rhizobium*

28. During biological nitrogen fixation the energy input is :
(1) 16 ATP for each NH_3
(2) 8 ATP for two NH_3
(3) 32 ATP for two NH_3
(4) 8 ATP for each NH_3

29. During nitrogen metabolism in plants, transaminase enzyme is used in conversion of:-
(1) Glutamic acid into other amino acids
(2) α-Ketoglutaric acid into glutamic acid
(3) Glutamic acid into glutamine
(4) NH_4^+ into glutamic acid

TG: @Chalnaayaaar

30. Proper aeration is required in hydroponics.
(1) to avoid the toxicity of minerals
(2) for translocation of mineral from root to shoot
(3) for absorption of minerals
(4) to decrease the osmotic pressure in root cells

31. Which of the following is not a beneficial element for plant life ?
(1) Na (2) Sr
(3) Si (4) Co

32. Water potential of a cell is mainly determined by which of the following element ?
(1) Mg^{++} (2) Ca^{++}
(3) K^{+} (4) Fe^{2+}

33. The element is said to be deficient, when present:
(1) below critical concentration
(2) above critical concentration
(3) at critical concentration
(4) both below and above critical concentration

34. Deficiency symptoms of element can be visualised by what kind of changes ?
(1) Physiological changes
(2) Morphological changes
(3) Chemical changes
(4) Anatomical changes

35. Deficiency symptoms for which of the following element tend to appear first in young tissues?
(1) N & P
(2) N & Ca
(3) Ca
(4) S & K

36. Mn toxicity leads to Ca deficiency by :
(1) competing with Ca uptake
(2) inhibiting translocation to shoot apex
(3) competetive inhibition for enzymes
(4) All of the above

TG: @Chalnaayaaar

37. What is the major fate of NH_3 produced by ammonification ?
(1) Volatilise to re-enter in the atmosphere
(2) Absorbed by plants
(3) Converted into nitrates
(4) Denitrification

38. In which of the following root tissues nodule formation is initiated after successful infection ?
(1) Epidermis (2) Cortex
(3) Endodermis (4) Root hairs

39. First stable product of biological nitrogen fixation is:
(1) HN = NH (2) $H_2N - NH_2$
(3) NH_3 (4) NO_3^- or NO_2^-

EXERCISE-III(B) ANALYTICAL QUESTIONS

40. Mineral absorption is :
(1) Mostly passive with water absorption
(2) Mostly passive without water absorption
(3) Mostly active
(4) Always active

41. Molybdenum is essential :-
(1) For RuBisCO of cyanobacteria
(2) For nitrogenase enzyme
(3) For RuBisCO of eukaryotic organism
(4) For transaminase activity

42. Identify the correct match :

(i)	Marganese	(a)	Little leaf disease
(ii)	Zinc	(b)	Stout axis
(iii)	Boron	(c)	Splitting of water
(iv)	Molybdenum	(d)	Nitrogen metabolism

(1) i-c, ii-b, iii-a, iv-d
(2) i-c, ii-a, iii-b, iv-d
(3) i-b, ii-a, iii-d, iv-c
(4) i-c, ii-b, iii-d, iv-a

TG: @Chalnaayaaar

43. How many essential elements in the list given below are nonmineral elements?
Manganese, Carbon, Magnesium, Hydrogen, Oxygen, Calcium.
Options :
(1) Six (2) Three
(3) Two (4) Four

44. The main chemotactic substances, released by roots of legume plants to attract *Rhizobium* bacteria, are :-
(1) rhicadhesin proteins
(2) flavonoids
(3) lectin proteins
(4) leghaemoglobin

45. Which of the following statements is not correct?
(1) Formation of amides from amino acids by addition of amino group is called catalytic amidation.
(2) Growing of plants in nutrients rich moistened air is called aeroponics
(3) C, H, O are called frame work elements
(4) 'nif' gene is present in both *Rhizobium* bacterium and legume plant to induce nitrogenase formation.

EXERCISE-III ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	2	4	3	4	3	4	3	1	3	3	2	1	3	2	2
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	4	4	3	2	2	1	3	3	4	1	1	3	4	1	3
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	2	3	1	2	3	2	3	2	3	3	2	2	2	2	4

TG: @Chalnaayaaar

Important Notes